United States Department of Agriculture

USDA

Economic Research Service

Food Assistance and Nutrition Research Report Number 31

Assessment of WIC Cost-Containment Practices

Executive Summary

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Food Assistance & Nutrition Research Program

Assessment of WIC Cost-Containment Practices: Executive Summary. By John A. Kirlin, Nancy Cole, and Christopher Logan, Abt Associates Inc. Phil R. Kaufman, ERS project representative. Food and Rural Economics Division, Economic Research Service, U.S. Department of Agriculture. Food Assistance and Nutrition Research Report No. 31.

Abstract

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides both nutrition education and supplemental foods containing nutrients determined by nutritional research to be lacking in the diets of pregnant, breastfeeding, and postpartum women, infants, and children. State WIC agencies have implemented practices designed to reduce the cost of food packages containing these prescribed foods. For instance, one of the WIC program's primary cost-saving practices is negotiating rebate contracts with manufacturers of infant formula. Additional practices include limiting authorized vendors to stores with lower food prices; limiting approved brands, package sizes, forms, or prices; and negotiating rebates with food manufacturers or suppliers. There is concern that these practices may inadvertently counter the program's goal of providing supplemental foods and nutrition education. Based on a review of cost-containment practices in six States, including interviews with the various stakeholders and analysis of WIC administrative files, the study draws three major conclusions: (1) cost-containment practices reduced average food package costs by 0.2 to 21.4 percent, depending on practices implemented and local conditions; (2) the cost-containment practices had few adverse outcomes for WIC participants; and (3) administrative costs of the practices were low, averaging about 1.5 percent of food package savings.

The full report, *Assessment of WIC Cost-Containment Practices: Final Report*, is available online at www.ers.usda.gov/publications/efan03005.

Keywords: WIC Program, cost-containment, food-item restrictions, vendor restrictions, manufacturers' rebates, food package costs

Cover photos courtesy of:
Jeffrey Kaufman and Anna Sorensen *(woman shopping for eggs)*

Washington, DC 20036-5831 May 2003

Acknowledgments

The other authors and I would like to thank the many individuals who helped with this study and assisted with preparation of this final report.

At the U.S. Department of Agriculture, Economic Research Service, Phil Kaufman served as Project Officer for the study. In this capacity, he played a major role in developing the study's statement of work and its overall research design. He coordinated all contacts with the Food and Nutrition Service of USDA, and offered valuable assistance during data collection and analysis. Finally, he led and coordinated the technical review of this final report; the scope and content of the report bear his imprint in many ways.

Also at ERS, David Smallwood, Betsey Kuhn, and James Blaylock provided important support and oversight. Gerald Plato assisted in the early stages of the study with its research design. Both he and Elizabeth Frazao served as technical reviewers for numerous drafts of the report and provided valuable comments. Linda Hatcher, Courtney Knauth, and Victor B. Phillips, Jr., provided editorial and graphic design assistance. At FNS, Dawn Aldridge provided important input into both the contract award and technical review of drafts.

A great appreciation goes to the WIC program directors and staff in the six States that participated in this study: California, Connecticut, North Carolina, Ohio, Oklahoma, and Texas. In addition to participating in lengthy interviews about their cost-containment practices, they provided data files and other critical information needed for the study. We thank them for their full cooperation and assistance, and for the comments they provided on a draft of this report.

We also wish to thank the many WIC participants, vendors, and other stakeholders who responded to our requests for information during the course of the study. We interviewed nearly 1,300 WIC participants, collected price data from over 100 WIC vendors, collected detailed point-of-sale information on WIC transactions in nearly 600 supermarkets, and conducted focus groups with participants who had dropped out of WIC. We also conducted interviews with representatives of the Food Marketing Institute, the Grocery Manufacturers of America, the National Grocers Association, the National WIC Association, the Private Label Manufacturers Association, and the national and regional offices of the FNS. To all these individuals, vendors, and groups, we extend our heartfelt thanks.

Many individuals at Abt Associates and its subcontractors for the study helped with the analysis or preparation of the final report. Charles Pappas of SmartSource Direct recruited the supermarkets that provided WIC transaction data, and Terry Stewart of Marketing Resources International conducted the focus groups with WIC dropouts. At Abt Associates, John Straubinger and Michael Harnett were survey directors for the study. Nancy McGarry and Ellie Lee served as the study's programmers, and Mary Kay Crepinsek, Dave Rodda, Joanna Golding, and Lisa Litin helped with the analyses. Chris Holm participated in the interviews with State and local officials. Finally, Fred Glantz and Nancy Burstein helped review the final report, and Susan Byers Paxson directed its production, with assistance from Jan Nicholson. Our thanks go to all our colleagues who worked with us on this project.

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Contents

List of Tables

List of Figures

Assessment of WIC Cost-Containment Practices

Executive Summary

John A. Kirlin
Nancy Cole
Christopher Logan

The Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), together with designated State agencies, administers the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The WIC program provides both nutrition education and supplemental foods containing nutrients determined by nutritional research to be lacking in the diets of pregnant, breastfeeding, and postpartum women, infants, and children. Funding is provided by FNS to State WIC agencies through annual appropriations from Congress. Each State's cash grant includes a food grant and a Nutrition Services and Administration (NSA) grant. In FY2001, food grants totaled $3.0 billion, or approximately 73 percent of the total cash grant. Cost savings through infant formula rebates provided an additional $1.5 billion in funding; FNS estimates that the rebates would support about 28 percent of the WIC caseload.

In an effort to ensure the best use of available funds and to provide for participation by all eligible individuals, State WIC agencies have implemented practices designed to reduce the cost of food packages containing these prescribed foods. For instance, one of the WIC program's primary cost-saving practices is negotiating rebate contracts with manufacturers of infant formula. Additional practices include limiting authorized food vendors (such as supermarkets and grocery stores) to outlets with lower food prices; limiting food-item selection according to brand, package size, form, or price (for instance, requiring purchase of least cost items); and negotiating rebates with food manufacturers or suppliers.

Concerns have been raised that vendor-selection practices may reduce WIC participants' access to authorized vendors, and that item-selection practices and manufacturers' rebates may reduce participant satisfaction with allowed food items. Lower satisfaction may lead to lower consumption of certain foods or a decision to leave the program. In either case, the cost-containment practices may have the inadvertent effect of countering the program's goal: to provide supplemental foods and nutrition education in order to safeguard and improve nutritional intake, birth outcomes, child development, and health outcome measures.

Purpose of Study

As part of the William F. Goodling Child Nutrition Reauthorization Act of 1998, the U.S. Congress directed the Economic Research Service (ERS), USDA, to assess the impacts of WIC cost-containment practices on the following outcome measures:[1]

- Program participation.
- Access and availability of prescribed foods.
- Voucher redemption rates and actual food selections by participants.
- Participants on special diets or with specific food allergies.
- Participant use of and satisfaction with prescribed foods.
- Achievement of positive health outcomes.
- Program costs (includes both food and administrative costs).

In a competitive bidding process, ERS contracted with Abt Associates Inc. in September 1999 to conduct this research study. This executive summary presents the main findings of the study.[2]

[1]In accordance with the legislation authorizing this study, the impacts of infant formula rebates were not assessed during this research.

[2]The citation for the full report is John A. Kirlin, Nancy Cole, and Christopher Logan, *Assessment of WIC Cost-Containment Practices: Final Report*, Economic Research Service, U.S. Department of Agriculture, February 2003 (electronic publication E-FAN-03-005).

The study examines the relationships between State WIC cost-containment practices, program costs, and WIC participant outcomes. Prior research has identified possible practices to lower WIC food costs.[3] Little is known, however, about the specific impacts, both on participants and State WIC agencies, of various measures taken to contain food costs.

There is considerable variation in cost-containment practices used by State WIC agencies. Because of the potential differences in the use and implementation of these practices by States, ERS decided upon a case study research design that would serve to identify the linkages between various types of cost-containment and Agency and participant outcomes. After a detailed State-by-State review of WIC cost-containment practices, six States were selected for case study: California, Connecticut, North Carolina, Ohio, Oklahoma, and Texas.[4] These States represent a mixture of practices and, in particular, they had practices that were thought to be restrictive enough to have measurable outcomes. Throughout this study, those outcomes in States with specific practices are compared with outcomes in States without those practices.

As displayed in table 1, five of the six States (all but North Carolina) applied competitive pricing criteria at vendor application to ensure that stores with excessive prices were not authorized to participate. Connecticut, Oklahoma, and Texas, however, were the only States with explicit thresholds for price above which stores could not be authorized; the study treats these three States as the "restrictive" States (with respect to vendor restrictions) when comparing outcomes between restrictive and nonrestrictive States.[5]

All six States imposed food-item restrictions according to price, brand, package size or form, or number of allowed types within a food category. North Carolina and Ohio, however, had relatively few food-item restrictions; they were selected for the study to represent States without such restrictions. The States imposing specific restrictions varied by food category, so the "restricted" group of States also varies by food category in the analyses.

California, Connecticut, and Texas contracted with a single manufacturer for rebates on infant cereal. From a participant's perspective, such rebates are similar to State limits on allowed brands, and the study treats these two cost-containment practices similarly with regard to their impact on participants.

This study does not provide national estimates of the impacts of WIC cost-containment practices because the six case study States were not randomly selected. In addition, the results of this study, for any of the six case study States, cannot be considered representative of any State outside of the study. Instead, as the case study approach allows, the focus is on understanding the linkages between specific cost-containment practices, or combinations of practices, and their outcomes. The data used in the study to examine outcomes are described in appendix B.

Summary of Findings

There are three major findings from this study:

(1) Four of the six case study States (California, Connecticut, Oklahoma, and Texas) imposed restrictions on many WIC foods in an effort to reduce food package costs. Their efforts were successful, reducing monthly food package costs by an average of nearly 15 percent.

(2) Cost-containment practices were associated with few adverse outcomes for WIC participants.

(3) State and local office administrative costs attributed to cost-containment practices were relatively low. In the four States with substantial food-item restrictions, administrative costs averaged less than 1.5 percent of estimated food package savings. These costs averaged about 0.4 percent of the States' annual NSA funds.

Due to the nature of case studies, these findings cannot be construed as applicable to all States. In addition, the success of cost-containment practices in these States was the result of their ongoing efforts to find those practices that both reduced food package costs and were acceptable to participants.

[3] *Food Assistance: A Variety of Practices May Lower the Cost of WIC*, GAO/RCED-97-225, September 17, 1997.

[4] Appendix A presents two tables summarizing the cost-containment practices used by States in 1999. This information was used in selecting the six case study States, as described in the study's interim report. See John A. Kirlin and Nancy Cole, *Assessment of WIC Cost-Containment Practices: An Interim Report to Congress*, Economic Research Service, U.S. Department of Agriculture, February 2001 (electronic publication E-FAN-01-005).

[5] In California, price thresholds were used to identify excessive prices for individual food items, not to deny authorization to vendors. Ohio's use of competitive pricing applied only when numeric limits were reached, a condition that had never been met at the time of the study.

Table 1—Summary of State WIC cost-containment practices, FY2001

State (WIC caseload)[1]	Vendor restrictions	Food-item restrictions[2,3]
California (1,243,509)	Applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized[4]	No items subject to least expensive brand restriction Many food items subject to restrictions on package size or form Narrow choice for cheese, infant cereal, cereal, and juice Rebates on infant cereal
Connecticut (49,253)	Applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized	Many food items subject to least expensive brand restrictions Few restrictions on package size or form Narrow choice for infant cereal and peanut butter Rebates on infant cereal
North Carolina (200,121)	None[5]	Only milk was subject to least expensive brand restrictions Milk and cereals subject to restrictions on package size or form
Ohio (247,092)	Applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized[6]	No items subject to least expensive brand restriction Few restrictions on package size or form
Oklahoma (87,467)	Applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized	Many food items subject to least expensive brand restrictions Milk, cereal, and juice subject to restrictions on package size or form Narrow choice for juice and cereal
Texas (750,122)	Applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized	Milk and juice subject to least expensive brand restrictions Milk, cereal, and juice subject to restrictions on package size or form Narrow choice for juice Rebates on infant cereal

[1]Average participation level in FY2001.
[2]"Narrow" choice means that State was in bottom quartile in number of approved items, among all 50 States.
[3]Food-item restrictions are in addition to Federal WIC requirements.
[4]California's competitive pricing policy assessed the reasonableness of prices of individual food items.
[5]North Carolina did not have a competitive pricing policy in place, but did require vendors to submit price lists at application, as well as twice a year thereafter. State officials did not have the authority to deny authorization due to high prices, but they could ask vendors to use "more reasonable" prices.
[6]Criteria used only when numeric limits were reached, a condition that had never been met at the time of the study.

Main Findings by Outcome Measure

Program Costs: Food Costs and Food Cost Savings

Issue: The cost of WIC foods varies considerably from State to State. Factors such as differences in allowed foods, food prices, caseload composition, and differences in the needs of participants and the food prescriptions they receive make cross-State comparisons difficult. In addition, States lack information about likely food cost savings due to their cost-containment practices. Better information about food costs and food cost savings would allow States to assess cost-containment practices.

Findings: Average food package costs (excluding the cost of infant formula, tuna, and carrots) varied from a low of $24.26 per participant per month (PPM) in Oklahoma to a high of $35.72 PPM in California. The largest contributors to average food package costs in the six States were milk, juice, cereal, and cheese.[6] Cost-containment practices led to estimated savings as high as $6.43 PPM in Oklahoma and $7.33 PPM in Texas. On a percentage basis, these savings represented estimated reductions in average food package costs of 21.0 and 21.4 percent, respectively. The large savings in Oklahoma and Texas were due primarily to food-item restrictions on juice and cereal.

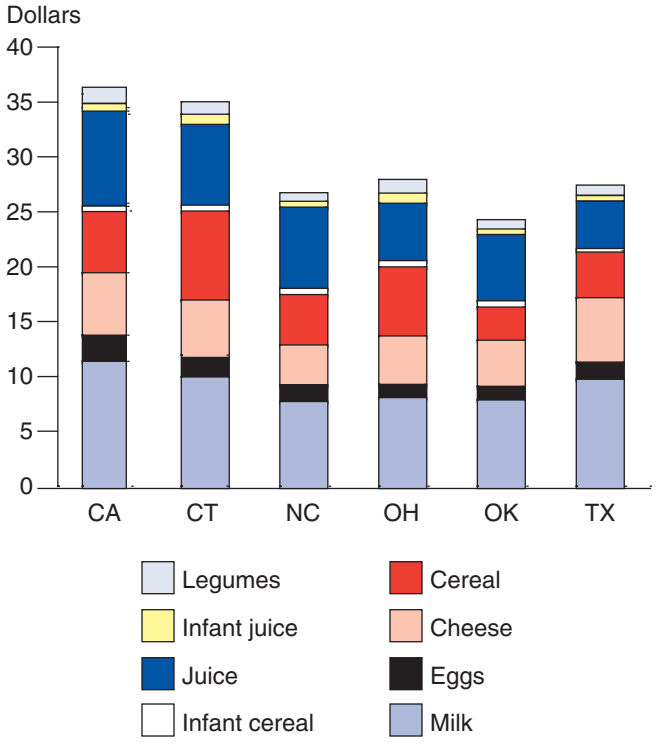
Average food package costs, overall and by food category, were estimated for each State based on prices within the State, the State's approved food list, and participant preferences among the list of approved foods. Formula costs are not included in the estimates because infant formula was specifically excluded from the study by the authorizing legislation. Furthermore, costs for tuna and carrots are not included because these foods were not subject to cost-containment restrictions in any of the six States, and thus could not contribute to food cost savings. For these reasons, the average food package costs should not be compared with published averages for these or other States.

[6]Among the six States, milk represented about 31 percent of total estimated costs (excluding infant formula, tuna, and carrots). In descending order, the percentage of food package costs represented by the other categories were juice (22 percent), cereal (18 percent), cheese (16 percent), eggs (6 percent), legumes (3 percent), infant juice (2 percent), and infant cereal (2 percent).

As shown in figure 1, average food package costs varied from a low of $24.26 PPM in Oklahoma to a high of $35.72 PPM in California. Costs are estimated for milk, eggs, cheese, cereal, infant cereal, juice, infant juice, and legumes (peanut butter and dried beans or peas). The figure shows the relative magnitude of costs associated with each food category; the largest contributors to average food package costs in these States were milk, juice, cereal, and cheese.

Food cost savings due to cost-containment practices were also measured. For each food category, estimates of average food costs were compared with "counterfactual" situations representing the absence of restrictions. Participant preferences, based on WIC food purchases in the unrestricted States, were used to estimate how often restricted items would be selected if State restrictions were removed. This information was then combined with food prices in the restricted States to estimate the counterfactual "average food cost," or the cost of what participants in the restricted States would buy in the absence of restrictions. Savings were esti-

Figure 1
Average food package costs per WIC participant per month



Note: Figure excludes costs of infant formula, tuna, and carrots.
Sources: Survey of Food Prices and Item Availability, State administrative data on food packages, and interviews with State officials.

mated as the difference between the estimated costs of the restricted and unrestricted food packages.

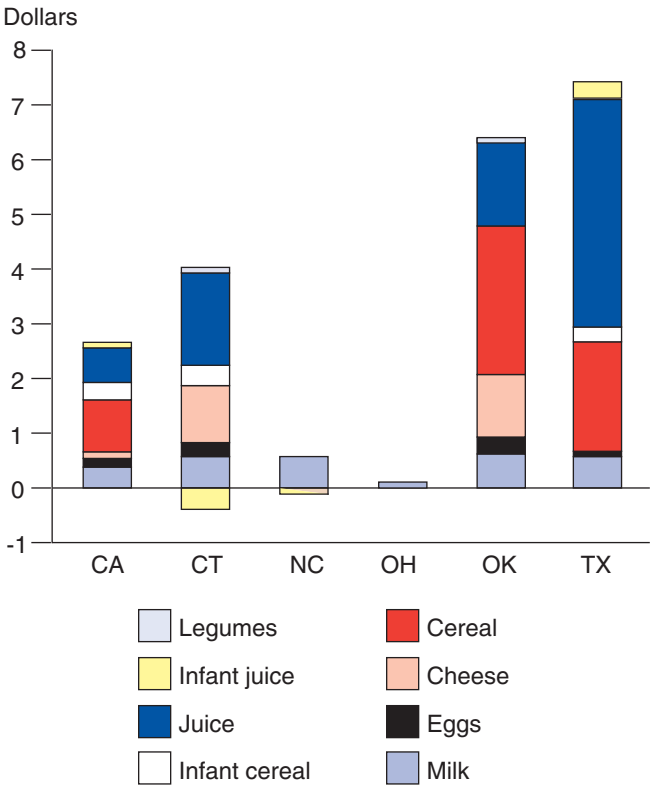
Figure 2 shows estimated food cost savings from cost-containment practices. Total savings were $2.66 PPM in California, $3.65 PPM in Connecticut, $0.51 PPM in North Carolina, $0.05 PPM in Ohio, $6.43 PPM in Oklahoma, and $7.33 PPM in Texas.[7] The small savings in North Carolina and Ohio were expected, as these States used few cost-containment practices. The large savings in Oklahoma and Texas were due primarily to food-item restrictions on juice and cereal. Oklahoma required purchase of store- or private-label brands for most allowed juice and cereal products, and restricted many juice purchases to 46-ounce cans, a less expensive form than bottled juice. Texas allowed a large number of cereal types and brands, but its specified minimum package sizes were generally larger than in the other States. For juice, Texas limited the number of allowed types, required purchase of the least expensive brand available, and restricted most juice containers to 46-ounce cans.

The total savings per participant per month in figure 2 represent substantial cost reductions. On a percentage basis, food-item restrictions reduced average food package costs (excluding costs for infant formula, tuna, and carrots) by an estimated 6.9 percent in California, 9.4 percent in Connecticut, 1.9 percent in North Carolina, 0.2 percent in Ohio, 21.0 percent in Oklahoma, and 21.4 percent in Texas. In California and Texas, the States with the largest WIC caseloads, estimated annualized savings from cost-containment practices were nearly $40 million and $66 million, respectively.[8] Even in Oklahoma, a State with a relatively small WIC caseload, estimated annualized savings were $6.7 million. In descending order of magnitude, estimated annualized savings in the other three States were $2.2 million (Connecticut), $1.2 million (North Carolina), and $148,000 (Ohio). The latter two States were included in the study to represent States with few food-item restrictions, which explains the smaller estimates of savings for them.

[7]In both Connecticut and North Carolina, prescribing single-strength juice for infants instead of infant juice led to increased costs, which show as negative savings in figure 2. For these two States, the height of the total savings column in the figure must be reduced by the negative savings amount to calculate an estimate of net savings.

[8]The study presents estimates of "annualized" savings rather than "annual" savings because variations in food prices or caseload throughout a year would affect annual savings. The study instead collected data on food costs and participant caseloads at one point in time and used these data to estimate monthly savings. The annualized savings are 12 times the estimate of monthly savings.

Figure 2
Average food cost savings per WIC participant per month[1]



[1]In both Connecticut and North Carolina, prescribing single-strength juice for infants instead of infant juice led to increased costs, which show as negative savings. For these two States, the height of the total savings column in the figure must be reduced by the negative savings amount to calculate an estimate of net savings.
Sources: Survey of Food Prices and Item Availability, State administrative data on food packages, and interviews with State officials.

Program Costs: Administrative Costs of Cost-Containment Practices

Issues: The primary purpose of WIC cost-containment practices is to reduce the average cost of WIC food packages. States, however, may incur additional administrative costs to implement and maintain cost-containment practices. In looking at the full impacts of cost-containment practices on program costs, therefore, the study must examine the impacts on administrative costs as well as food package costs.

Findings: When compared with the overall costs of program administration, the cost-containment practices implemented by the case study States were inexpensive to operate. In the four States with substantial food-item restrictions,

administrative costs averaged less than 1.5 percent of estimated food package savings. These estimated costs represented, on average, about 0.4 percent of the States' FY2001 NSA costs.

The study collected information from the States on the administrative costs of their cost-containment practices. Costs were estimated for the following: use of price data in vendor authorization; use of cost criteria in constructing WIC food lists; communicating information about price-based restrictions on allowable foods to participants and vendors; establishing and renewing infant cereal rebate contracts; and tracking and claiming the rebates. The estimated total administrative costs ranged from $0.01 PPM in Oklahoma to $0.10 PPM in Connecticut. These estimates may understate or overstate actual costs because the States could not always provide information needed to estimate costs for specific functions.[9] Even allowing for a considerable margin of error, however, costs related to cost-containment were small.

The study did not estimate the cost of designing and implementing (as opposed to operating) cost-containment practices because the States implemented these practices many years ago; data on implementation costs were not available.

Access to WIC Vendors

Issue: Competitive pricing policies are designed to lower the average cost of prescribed WIC food packages by keeping high-price stores out of the program. Such policies, however, may restrict WIC participants' access to vendors if the policy reduces the number of authorized stores.

Findings: Program officials in the States with competitive pricing policies said they rarely, if ever, denied vendor authorization based on prices. Instead, if prices were high, the stores agreed to reduce their prices for WIC transactions. Thus, one would not expect to find any impacts on participant access in these States. Comparison of participant shopping patterns confirms that competitive pricing policies had no significant impact on participant access.

Four of the six States (all but North Carolina and Ohio) applied competitive pricing criteria at application to ensure that stores with excessive prices were not authorized.[10] Connecticut, Oklahoma, and Texas had the most explicit and restrictive policies, using a fixed threshold for evaluating prices of a standard package of WIC foods. Program officials in all four States, however, said that they rarely, if ever, denied vendor authorization based on prices. Instead, if prices were high, the stores agreed to reduce their prices for WIC transactions.

Although very few stores were denied WIC authorization because of high prices, it is possible that pricing criteria kept some higher priced stores from applying to WIC at all. This could lead to problems with participant access to WIC-authorized outlets if enough stores elected not to apply.

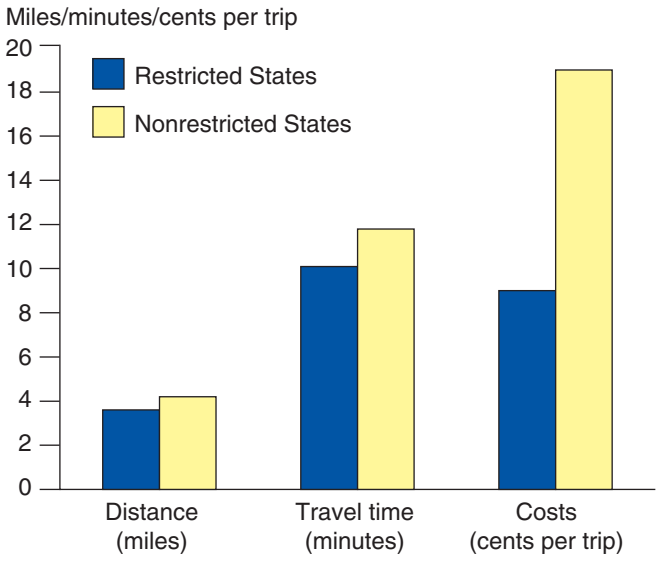
Examination of shopping patterns, as measured in the Survey of WIC Participants, indicates that vendor pricing restrictions in the three most restrictive States had no impact on participant access to WIC vendors.[11] As shown in figure 3, survey respondents in the three

[9]In some instances, activities supporting cost-containment practices were so integrated with other administrative processes that State officials could not provide estimates of the cost-containment portion of the activity.

[10]Ohio's policy of competitive pricing applies only when limits on the number of authorized vendors in an area have been reached. These limits had never been reached at the time that data for this study were collected.

[11]The Survey of WIC Participants, described in appendix B, was a survey conducted specifically for this study. It is not to be confused with USDA's National Survey of WIC Participants and Their Local Agencies (NSWP), conducted in 1998.

Figure 3
Participant access to WIC vendors



Note: The restricted States include Connecticut, Oklahoma, and Texas. None of the differences between restricted and nonrestricted States is statistically significant.
Source: Survey of WIC Participants.

States with vendor restrictions, as a group, did not travel farther or longer to do their WIC shopping, compared with their regular shopping, than participants in the remaining States, nor did they pay more in out-of-pocket expenses. If vendor restrictions had reduced participant access, the columns for restricted States in the figure would be taller than those for the nonrestricted States; instead, they are shorter.

A major reason for finding no relationship between price restrictions and access to vendors is that most survey respondents said they did their WIC and regular shopping at the same store. A cross-State average of only 13.0 percent did their WIC and non-WIC shopping at different stores.

Availability of Prescribed Foods

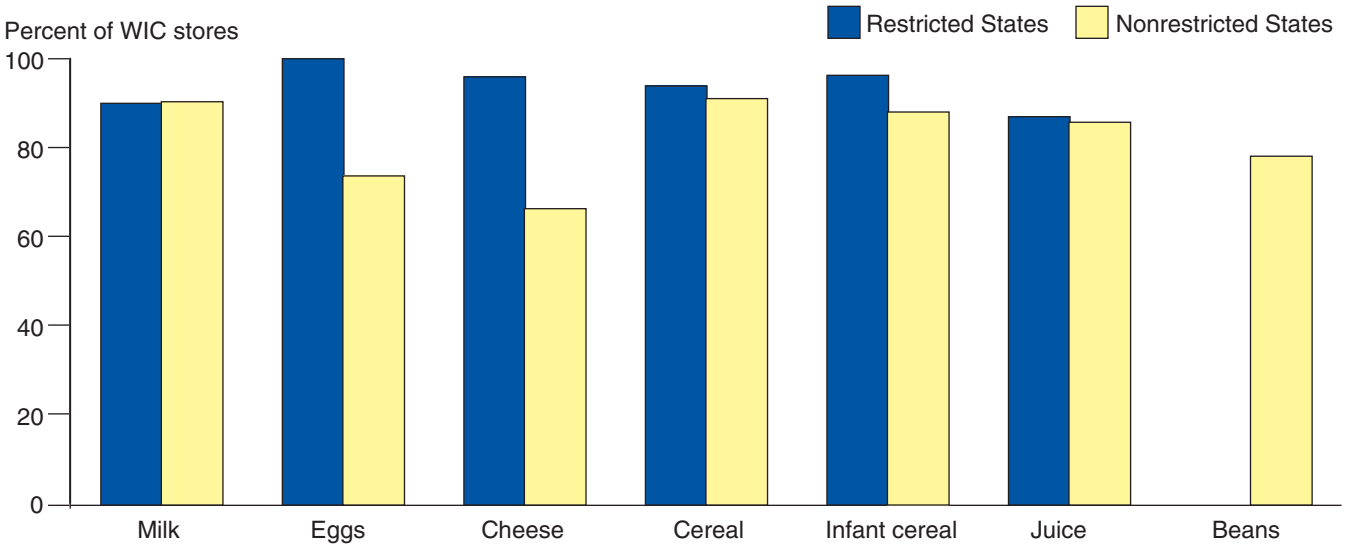
Issue: Cost-containment practices may reduce the availability of prescribed WIC foods in two ways. First, if competitive pricing restrictions have the unintentional consequence of limiting access to well-stocked stores, then WIC participants may have difficulty finding prescribed foods at WIC vendors. Second, when State cost-containment practices limit the different food items that may be purchased with the WIC food instrument, the likelihood of finding an approved item at an authorized store may decrease.

Findings: The study found that restrictions on the brands, types, and packaging of prescribed foods did not reduce the availability of WIC items in a sample of stores in each State. Indeed, there is some evidence that approved items were more available, rather than less, at WIC-authorized stores in States with food-item restrictions.

The availability of approved food items in each State was checked during a store survey. As shown in figure 4, most WIC foods on approved food lists were stocked by most stores, especially in the States with food-item restrictions. The only food category falling below 70 percent availability was cheese in nonrestricted States.[12] Where significant differences existed in item availability between stores in States with and without restrictions on that item, the stores in the restricted States were always more likely, not less, to carry the item in inventory. This could reflect grocers' greater efforts or ability to maintain inventory of WIC-approved foods when the number of approved items was reduced. It may also reflect greater State enforcement of minimum inventory requirements when food-item

[12]The relatively low availability of cheese in nonrestricted States is because only 1.4 percent of the sampled stores in Texas carried Monterey Jack cheese, even though the cheese was on the State's list of approved foods.

Figure 4
Availability of approved WIC foods[1]



[1]Average availability of different WIC food items in each food category. None of the differences between restricted and nonrestricted States is statistically significant.
Note: The only restriction on dried beans/peas in the six States was Oklahoma's requirement that the least expensive brand available in the store be purchased. This requirement cannot affect availability (by definition), so the group of "restricted States" is undefined for dried beans/peas.
Source: Survey of Food Prices and Item Availability.

restrictions are in place.[13] Regardless, there is no evidence that the presence of cost-containment practices reduced the availability of prescribed foods.

The columns in figure 4 represent an average availability of food items in each food category, and they can mask underlying variation. Thus, for instance, milk availability in restricted States averages 90 percent in figure 4. In these same States, 100 percent of sampled stores carried whole, 2-percent reduced-fat, and evaporated milk. For other types of milk, the percentages of stores carrying the milk varied: 1-percent low-fat milk (88.0 percent), nonfat milk (78.8 percent), nonfat dry milk (82.1 percent), and lactose-reduced or lactose-free milk (81.0 percent). Similar variation exists in the nonrestricted States and for other food categories. For no food item, however, were stores in restricted States significantly less likely to carry the item than stores in nonrestricted States.

Another way to examine the impact of cost-containment practices on food availability is to compare the percentages of stores in States with and without restrictions that meet WIC's minimum variety requirements for store inventory. Nearly all stores met the requirements for all food categories. There were no significant differences between the States with and without restrictions.

Participant Satisfaction With and Use of Prescribed Food

Issue: State practices to reduce food package costs—by restricting brands, types, or packaging of allowed foods—limit WIC participants' food choices. One of the concerns with food-item restrictions is the possibility that State limits on allowed foods may adversely affect WIC participants' satisfaction with their WIC food package. In turn, lower satisfaction may reduce their likelihood of purchasing and consuming all the prescribed foods. If such an adverse effect exists, then this cost-containment practice may have an undesired impact on the WIC program's ability to improve the nutritional status of participants.

Findings: Most WIC participants surveyed for this study indicated they were "very satisfied" with the brands of food and package sizes allowed on their State's list of approved foods, although exceptions existed (only about 50 percent were very satisfied with allowed brands of cereal). Differences in satisfaction levels between States with and without restrictions are small and statistically insignificant. There is also no evidence that food-item restrictions caused participants to buy less food, and the purchased food in States with restrictions was usually just as likely to be eaten as food purchased in States without food-item restrictions. In each State, however, more than 10 percent of surveyed participants reported a preference for a federally approved food item not on the State's list of allowed foods—a State-imposed "binding constraint" on their food purchases. Restrictions on cereal caused the most binding constraints, followed by cheese.

Table 2 displays the food-item restrictions used by the six case study States during the first half of 2001, when data for this study were collected. It provides more detail than table 1 because restrictions for each food category are listed. The most common restriction in the States was the requirement that participants purchase the least expensive brand of a food category (usually milk, eggs, or cheese) in the store.

Among the case study States, most surveyed WIC participants indicated they were "very satisfied" with the brands of food allowed on their State's list of approved foods (fig. 5). Brand satisfaction was highest for milk, cheese, infant cereal, and juice, with satisfaction levels generally near or above 80 percent. About 65 percent of respondents said they were "very satisfied" with allowed brands of peanut butter, and a little more than 50 percent indicated satisfaction with allowed brands of cereal. Most importantly, when overall satisfaction levels in States with restrictions are compared with levels in the nonrestrictive States, the differences in figure 5 are small and usually not statistically significant. Only for cheese and cereal did food-item restrictions affect levels of satisfaction with allowed brands.

With regard to "use" of prescribed foods, the study examined both the purchase and consumption of WIC foods by asking survey respondents how much of their monthly prescription they purchased, and how much of the purchased food they (or other WIC members of the household) ate or drank. Figure 6 shows the percentage of respondents who said they purchased all the food prescribed for WIC members of their family, by food category. The only category with a statistically significant difference between the restricted and nonrestricted States was juice, but purchase rates for juice were higher in the restricted States (97.9 to 94.3 percent)

[13]Data to address either hypothesis were not collected for the study.

rather than lower. Thus, the evidence indicates that cost-containment practices in these States did not affect rates of food purchase.

Similarly, figure 7 shows the percentage of WIC families saying they ate or drank all of the WIC food they had purchased. In this figure, there are several differences that are statistically significant. Survey respondents in States with restrictions were less likely to drink all the milk they had purchased (81.9 percent vs. 89.6 percent in nonrestrictive States), less likely to eat all the eggs purchased (70.6 vs. 83.1 percent), and less likely to eat all the dried beans or peas purchased (57.2 vs. 72.0 percent). This suggests that cost-containment factors may have affected consumption of WIC foods. As discussed below, however, some of these differences were likely due to reasons unrelated to cost-containment practices.

Detailed findings on satisfaction, purchase, and consumption—by food category—were:

- ***Milk***: Four States (Connecticut, North Carolina, Oklahoma, and Texas) required participants to purchase the least expensive brand of milk. The percentage of respondents purchasing all their prescribed milk was not related to these least cost restrictions. Although the percentage of respondents

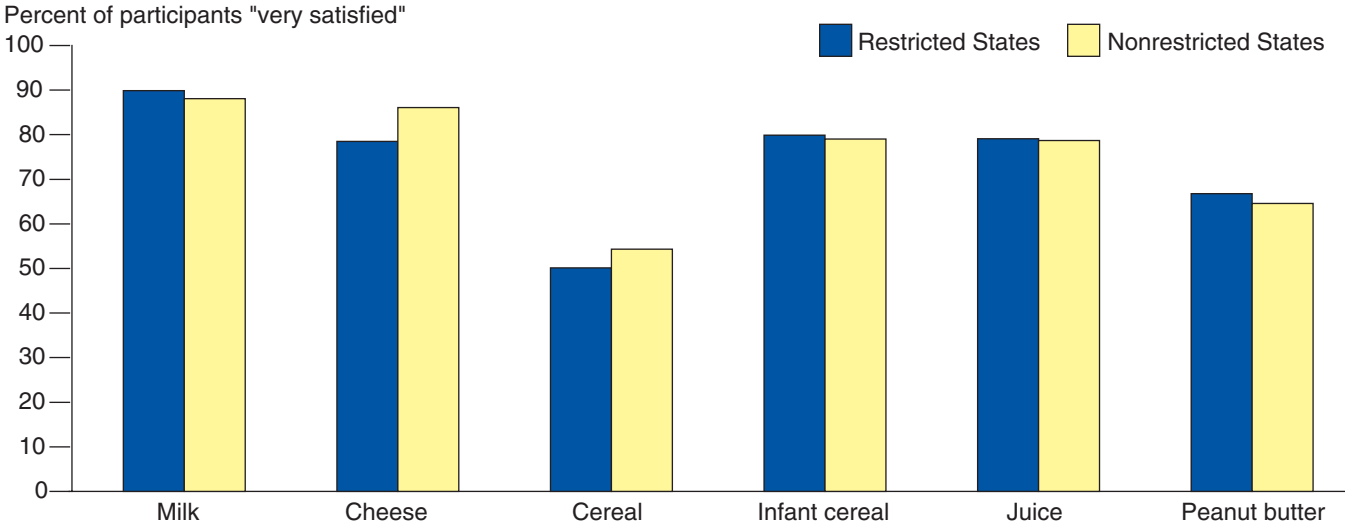
Table 2—Food-item restrictions, by food category

Food category	Food-item restrictions
Milk	Connecticut, North Carolina, Oklahoma, and Texas required purchase of least expensive brand
	California, Ohio, and Oklahoma generally limited purchase to gallon containers
Eggs	Connecticut and Oklahoma required purchase of least expensive brand
	California, Connecticut, Oklahoma, and Texas limited the number of different types that could be purchased
Cheese	Connecticut and Oklahoma required purchase of least expensive brand
	California and Oklahoma limited the number of different types that could be purchased
	All States except North Carolina prohibited purchase of individually wrapped slices of cheese
Cereal	California limited the number of different types that could be purchased
	Oklahoma generally limited purchase to private-label or store brands
Infant cereal	California, Connecticut, and Texas negotiated a rebate with one manufacturer, thereby limiting purchase to one brand
Juice	California, Oklahoma, and Texas placed restrictions on package size or form
	Connecticut and Texas required purchase of least expensive brand for some types
	California and Texas limited the number of different types that could be purchased
	Oklahoma generally limited purchase to private-label or store brands
Infant juice	California, Connecticut, North Carolina, and Texas prescribed single-strength adult juice instead of infant juice
Peanut butter	Connecticut required purchase of least expensive brand
Dried beans or peas	Oklahoma required purchase of least expensive brand

drinking all their purchased milk was lower in the States with restrictions than in the nonrestrictive States, the evidence suggests that factors other than brand dissatisfaction accounted for this difference. The factors cited most often by respondents were that "too much" milk was prescribed and that other (non-WIC) members of the household drank some of the milk.

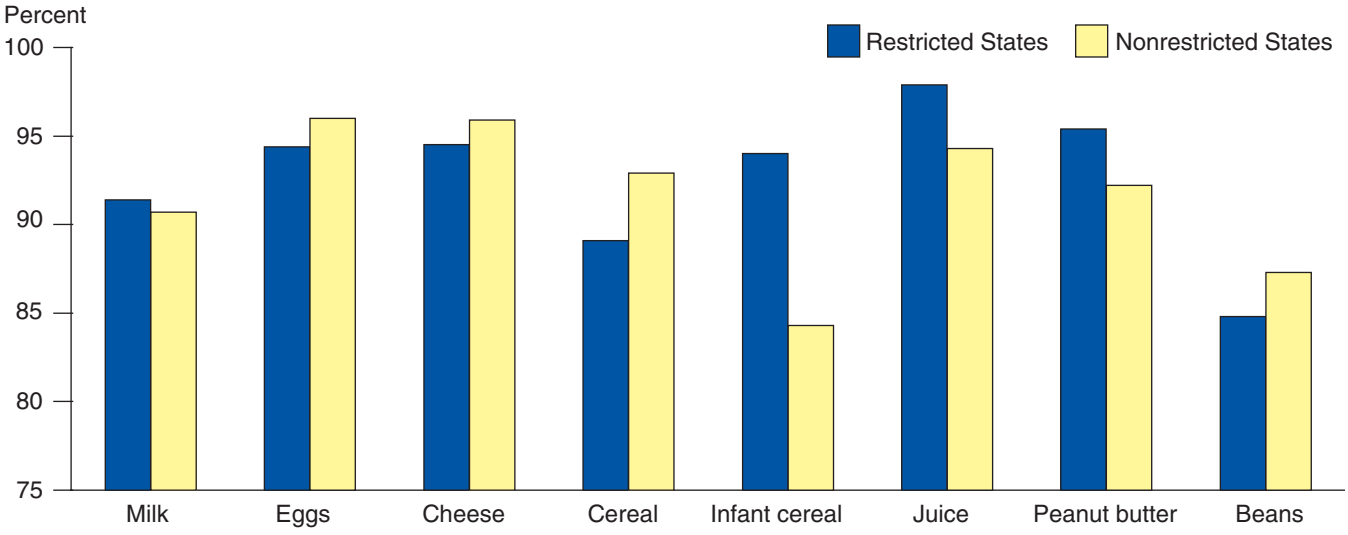
- ***Eggs:*** Connecticut and Oklahoma required purchase of the least expensive brand of eggs available. These restrictions had no impact on the amount of eggs purchased. Consumption of purchased eggs in the two restricted States was lower than in the other States, but apparently not because of the imposed restrictions. The most commonly cited factor for not eating all the purchased eggs was that too many were prescribed.

Figure 5
WIC participant satisfaction with allowed brands of food



Note: The only statistically significant differences between restricted and nonrestricted States are for cheese and cereal.
Source: Survey of WIC Participants.

Figure 6
WIC families buying "all" prescribed food



Note: The only statistically significant difference between restricted and nonrestricted States is for juice.
Source: Survey of WIC Participants.

- ***Cheese:*** Survey respondents in California, Connecticut, and Oklahoma were a bit less satisfied with allowed brands of cheese than respondents elsewhere. Respondents in States with and without cheese restrictions, however, were equally likely to purchase and eat the cheese that had been prescribed for them by the local WIC office.

- ***Cereal:*** California and Oklahoma were the most restrictive States with regard to allowed brands or types of cereal. California limited the types of cereal that could be purchased, and Oklahoma required purchase of store-brand or private-label cereals. When responses of sampled respondents in these two States were compared with those in the other States, there were no significant differences in satisfaction with allowed brands or the amount of cereal purchased or consumed. When Oklahoma is looked at separately, however, brand satisfaction and the amount of cereal that survey respondents said they purchased and consumed were lower (by 22.1, 7.4, and 11.4 percentage points, respectively) than in the other States.[14]

- ***Infant cereal:*** With rebate contracts in place, California, Connecticut, and Texas allowed only Gerber infant cereal to be purchased. The brand restriction did not reduce the amount of infant cereal purchased or eaten. It is unclear why infant cereal was more likely to be consumed in the restricted States than in the nonrestricted States.

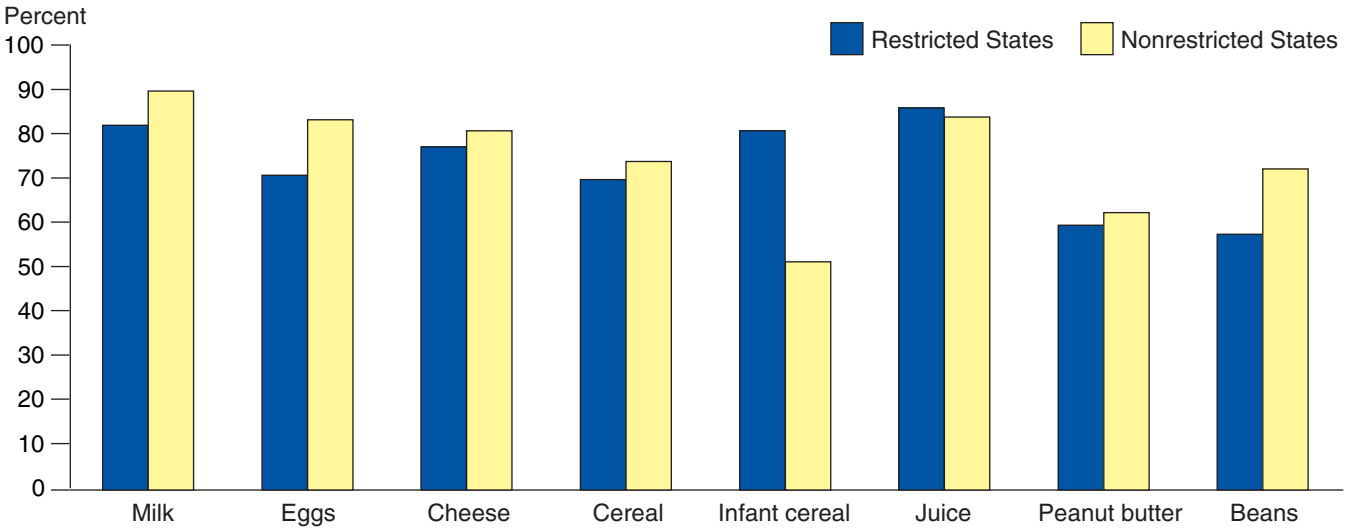
- ***Juice:*** Four States had restrictions on the purchase of single-strength juice. Connecticut and Texas required purchase of the least expensive brand for some or all of their approved juices, Texas and California restricted the allowed types of juice, and Oklahoma and Texas did not allow purchase of juice in plastic bottles. Oklahoma also approved only store brands or private labels for most juice types. State restrictions on allowed juice were not related to the amount of juice purchased or consumed.

- ***Peanut butter:*** Connecticut limited purchase of peanut butter to the least expensive brand available. This restriction had no impact on the amount of peanut butter bought or eaten.

- ***Dried beans or peas:*** Oklahoma was the only State to restrict dried beans or peas, requiring purchase of the least expensive brand available in the store. This restriction had no impact on the amount of dried beans/peas purchased, but it may have reduced the amount of purchased dried beans/peas that were eaten. Although the most common reason given for not eating all the food that had been purchased was that "too much" was prescribed, another common response was that the respondent did not like the

[14]In response to participant preferences, Oklahoma added some national-brand cereals to its list of approved foods after data for this study were collected.

Figure 7
WIC families consuming "all" purchased food



Note: Significant differences between restricted and nonrestricted States exist for milk, eggs, infant cereal, and dried beans/peas.
Source: Survey of WIC Participants.

beans or peas. This latter response may have indicated dissatisfaction with the taste or quality of the least expensive brand.

In order to further gauge participant satisfaction with allowed foods, the Survey of WIC Participants asked respondents whether there were any foods among cheese, cereal, infant cereal, and juice that they would like to buy with their WIC food instruments that were not on their State's list of approved foods. After eliminating preferences that did not meet Federal guidelines for WIC-approved foods (for example, high-sugar-content cereals), the study identified those survey respondents who faced a State-imposed "binding constraint" when shopping for WIC foods.[15] That is, how often did State food-item restrictions cause participants to change the foods they would have purchased in the absence of cost-containment practices?

The results vary considerably from State to State, although all the rates are below 20 percent (fig. 8). For cheese, the highest rates of binding constraints were in Oklahoma (15.7 percent) and Ohio (12.6 percent). North Carolina had the lowest rate (1.1 percent). Examination of respondents' preferences reveals that restrictions on individually wrapped cheese created many of the binding constraints. Restrictions on allowed types of cheese were also important; many of the respondents with binding constraints said they preferred to buy Colby-jack, which was allowed only in Texas. Thus, it was not the least expensive brand policies in Connecticut and Oklahoma that created most of the binding constraints, but rather packaging restrictions and limits on the types of cheese that could be purchased.

When asked about preferences for cereals not on their State's food list, a cross-State average of 10.0 percent named cereals that met Federal regulations. Oklahoma had the highest percentage of respondents facing a binding constraint on cereal (19.4 percent), followed by Connecticut (15.1 percent) and North Carolina (12.7 percent).[16] Only 5.4 percent of California respondents faced a binding constraint, suggesting that California WIC officials were effective in identifying a limited number of cereal types that satisfied the preferences of most of their WIC participants.

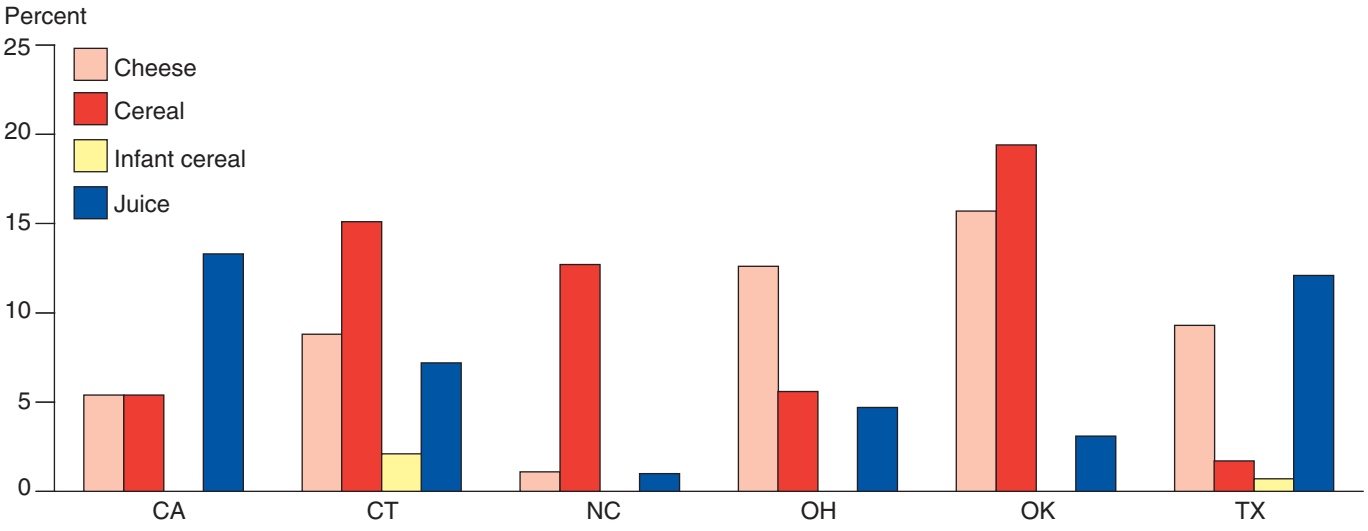
Participants with Special Diets or Food Allergies

Issue: WIC participants with special diets or food allergies have to be careful about the foods they eat. Although local WIC staff may tailor a participant's food package to avoid inappropriate foods (for instance, by prescribing dried beans instead of peanut butter for those with a peanut allergy), participants also have to be careful about food

[15]Though "binding" often means obligatory, it is used here in its sense of being confining or limiting.

[16]The high percentages in Connecticut and North Carolina seem puzzling because these States imposed few food-item restrictions. Upon inspection of the stated preferences of respondents, the high percentages were found to be due mostly to instant oatmeal (both States) and Kix (North Carolina) not being on their State's list of approved foods.

Figure 8
WIC families facing binding contraints on food choices



Source: Survey of WIC participants.

ingredients. One concern with State restrictions on allowed food items is that participants with special diets or food allergies may have problems shopping for appropriate foods, especially cereals, when well-known brands, with known ingredients, are not included on the State's list of allowed foods.

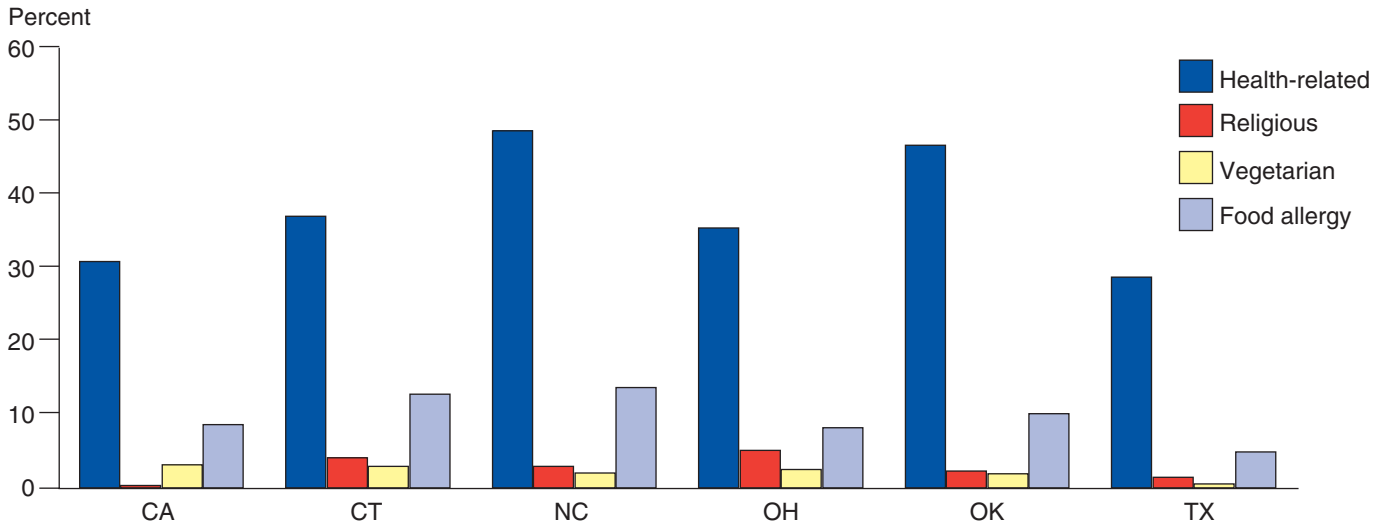
Findings: Relatively large percentages of WIC families reported having a WIC member with a special diet or food allergy. A cross-State average of 37.7 percent had a health-related special diet, 9.4 percent had a food allergy, 2.4 percent followed a religious diet, and 1.8 percent were vegetarians. Among these families, however, only 2.5 percent reported problems finding appropriate foods when shopping for WIC.

A large number of survey respondents said they (or another WIC member in the household) modified their diets for various health-related reasons; the modifications included high-fiber diets, sugar-free or low-sugar diets, and low-fat or low-cholesterol diets. Figure 9 shows the percentage of survey respondents on health-related diets. The percentage varied from a low of 28.5 percent in Texas to a high of 48.5 percent in North Carolina. The figure also shows the percentage of families in which a WIC member followed a religious or vegetarian diet, or had a food allergy. Depending on State, from zero to 4.8 percent of respondents said they followed religious diets, and from 0.2 to 2.8 percent said they followed vegetarian diets. Figure 9 also shows the percentage of families in which a WIC member had a food allergy. A cross-State average of 9.4 percent of survey respondents reported either that a doctor told them they (or another WIC member) had a food allergy, or they or the other individual had suffered a severe reaction after eating a meal. The percentage of WIC families with food allergies varied from 4.6 percent in Texas to 13.4 percent in North Carolina. Allergies to cow's milk were most prevalent.

Respondents with special diets or food allergies were asked whether their dietary restriction posed problems finding appropriate foods in their WIC shopping. Only 2.5 percent said yes. When asked a followup question about the nature of their shopping problem, the most common responses were that they could not find out what ingredients were in a food item or did not know whether approved brands were safe or appropriate to eat. The small numbers of respondents involved, however, suggest that food-item restrictions were not creating many problems for most WIC participants.

For each food category, patterns of brand satisfaction, purchase, and consumption of prescribed foods were compared for respondents with and without special diets or allergies, using multivariate analysis. There was no evidence that food-item restrictions had any disproportionate effects on these respondents. Participants on special diets or with food allergies were occasionally less satisfied with brands, or purchased or consumed less food than those without dietary restrictions, but the differences were no greater in States with food-item restrictions than those with none.

Figure 9
WIC families with special diets or food allergies



Source: Survey of WIC participants.

Food Instrument Redemption

Issue: Participant dissatisfaction with vendor or food-item restrictions could lead to reduced use of food instruments (that is, WIC vouchers or checks), defeating the program goal of supplementing participants' diets with nutritious foods. Three types of behavior could reduce food instrument use:

(1) Participants could fail to pick up their food instruments at the local WIC office or clinic.

(2) They could fail to redeem some or all of their food instruments.

(3) For instruments that are redeemed, participants could purchase only some of the prescribed foods.

Findings: WIC participants in the study States did not always pick up their food instruments, and they did not always redeem the instruments they picked up. Rates of pick up, however, were generally high; they ranged between 88.8 and 94.2 percent in these States. Redemption rates varied from 80.6 to 90.7 percent. State data on redemptions do not always allow determination of whether all foods on a food instrument were purchased, but survey evidence suggests that rates of partial redemption were low.

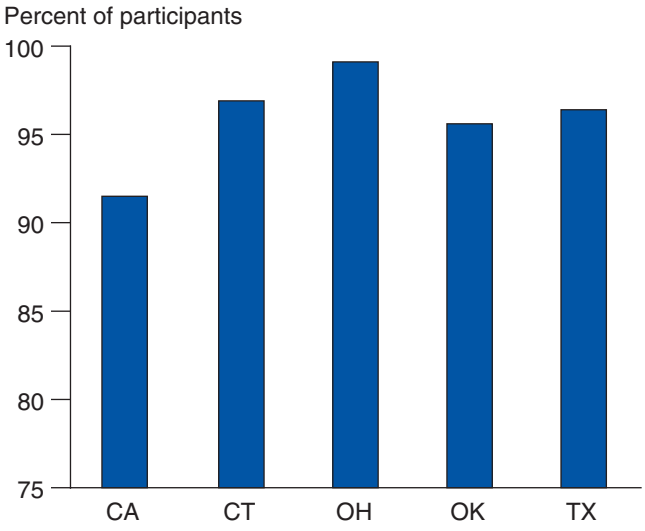
There is no evidence that food-item restrictions affected rates of partial food instrument redemption. Data limitations linked to how States combine different food categories on individual instruments prevented a conclusive examination of how food-item restrictions affected redemption rates, but the available data suggest that restrictions did not reduce food instrument use. Finally, food instrument pickup rates could not be related to the presence of restrictions because, when instruments were issued, participants had to pick up all instruments for the month, not just those they planned to use.

Rates of food instrument issuance/pickup (fig. 10) were high in the five States in which they could be calculated, varying from a low of 88.8 percent in Oklahoma to a high of 94.2 percent in Ohio.[17] Rates of food instrument redemption (fig. 11) varied from a low of 80.6 percent in Ohio to a high of 90.7 percent in California.

With regard to food instrument issuance/pickup rates, the effect of various food-item restrictions on issuance rates cannot be determined because participants must pick up all their instruments for the month at the same time. For example, if a participant did not want to buy cheese because the State did not include her (federally approved) favorite cheese on its list of approved foods, she could not pick up just those food instruments for the remaining foods in her prescription. Thus, administrative data

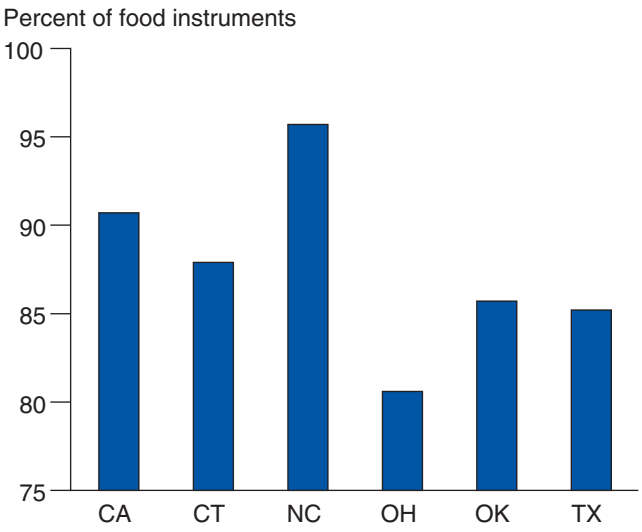
[17]A food instrument pickup rate could not be determined for North Carolina because the State could not provide complete data on food instrument issuances.

Figure 10
Rate of WIC food instrument issuance/pickup



Source: State administrative data on food instrument issuances.

Figure 11
Rate of WIC food instrument redemption



Source: State administrative data on food instrument issuances and redemptions.

on food instrument issuance cannot isolate the possible impacts of different food-item restrictions.

The impacts of food-item restrictions on redemption rates could be examined because participants can redeem instruments containing desired foods, while not using those containing foods whose appeal was reduced by the restrictions. However, the presence of multiple food categories on many food instruments made this a challenging analysis because some categories were subject to restrictions whereas others were not. Attempts to model the likelihood of food instrument use as a function of prescribed foods, food restrictions, and other variables were unsuccessful; model results were inconsistent and extremely sensitive to model specification. Examination of redemption rates, by State, for all instruments containing particular food categories found that redemption rates were often higher, rather than lower, in States with restrictions, suggesting that unmeasured State-level effects were obscuring any possible effects of the restrictions. Thus, if food-item restrictions did reduce rates of food instrument redemption in these States, the effects were too small to detect with available data.

The Survey of WIC Participants did ask about purchase behavior. The survey results do not unambiguously identify partial redemption, because respondents who said they did not buy "all" of a prescribed food could have either partially redeemed an instrument or not redeemed it at all. Nevertheless, the survey results provide an upper bound for rates of partial redemption.

The food category most often redeemed in full was cheese in California, where only 0.6 percent of respondents said they did not purchase all. The highest rate for not buying all was 33.5 percent for dried beans/peas in North Carolina. Averaged over all six States, the highest rates for not buying all prescribed food were 13.1 percent for dried beans/peas and 10.9 percent for infant cereal. Only one rate difference between restricted and unrestricted States was statistically significant (a 3.6-percentage-point difference for juice), but the direction was opposite to what one would expect from food-item restrictions. Thus, the survey results indicate that food-item restrictions were not related to rates of partial redemption.

Program Participation

Issue: One concern with the use of cost-containment practices is that they may reduce participants' satisfaction with the WIC program, leading to reduced participation, and hence, reduced distribution of health and nutrition benefits to eligible individuals. The study addressed this possibility by examining program "dropout" rates and conducting focus groups with WIC dropouts to determine whether State restrictions on vendors or food choice contributed to their decision to leave the program.[18]

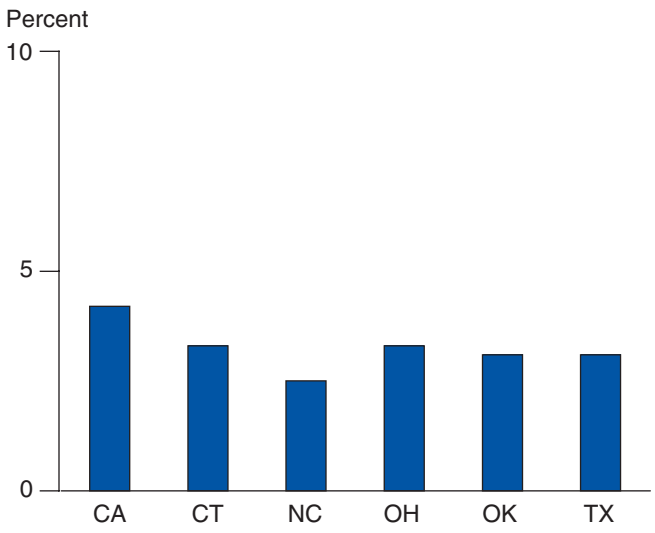
Findings: The WIC dropout rate varied from a low of 2.5 percent in North Carolina to a high of 4.2 percent in California. All the rates were relatively low. Focus groups with dropouts indicated that vendor and food-item restrictions generally were not the main reason participants stopped picking up their food instruments.

The study defined program dropouts as participants who failed to pick up their food instruments for 2 consecutive months in the 6-month period prior to November 2000 (except in California, where data limitations caused dropouts to be defined as participants who failed to pick up their most recent set of food instruments prior to November 2000).

The WIC dropout rate varied from a low of 2.5 percent in North Carolina to a high of 4.2 percent in California (fig. 12). All these rates were relatively low, and

[18]It was beyond the scope of this study to estimate the degree to which cost-containment practices may have kept otherwise-eligible individuals from applying to WIC. Based on the overall lack of adverse findings in the study, however, there is little evidence that cost-containment practices had any measurable adverse impact on program application rates in the case study States.

Figure 12
WIC dropout rates



Source: State administrative data on food instrument issuances.

factors unrelated to cost containment (for instance, problems getting to the clinic for an appointment, difficulty using the food instruments, or the belief that one was no longer eligible for WIC) explained some of the dropouts.

Focus group sessions were held with dropouts who said, during a screening interview, that vendor or food-item restrictions contributed to their dropping out. Finding enough dropouts who met the screening criteria proved difficult, suggesting that most dropouts failed to pick up their instruments for reasons unrelated to cost-containment practices. Indeed, even among the focus group respondents, the major reasons for dropping out were unpleasant experiences at WIC clinics and the "hassle" of picking up one's food instruments. Only about one-third of all focus group respondents said that food-item restrictions were their major or second most important reason for dropping out. Vendor restrictions were seldom mentioned. Thus, although cost-containment practices may have contributed to the decision of some participants to stop participating in WIC, the evidence suggests that any effects were small.

Health Outcomes

Issue: WIC cost-containment practices do not directly affect the health outcomes of WIC participants, but there is potential for an indirect effect. If limits on food choice result in reduced food instrument redemption or food use, then WIC's goal of improving health and nutrition status by providing nutrient-dense foods could be compromised. Similarly, if cost-containment practices cause participants to drop out of the program, they would not have access to the program's nutrition education and health referral services.

Findings: Based on study results, there is little evidence that the six States' cost-containment practices affected food instrument redemption, food use, or participation rates. Thus, the study concludes that these cost-containment practices could not have had adverse effects on health outcomes of participants.

Despite the conclusion that cost-containment practices could not have affected health outcomes because they did not affect food instrument redemption or food use, the study did examine the relationship between food instrument redemption rates and changes in four health measures, based on WIC participants observed in the November 2000 caseload and recertified by April 2001. The four health measures, and the groups of participants to which they were applied, are shown in table 3.

The analysis results were consistent for all four health outcomes. Using participant-level data from all six States, participants with higher rates of food instrument redemption had improved health outcomes.[19] The magnitudes of all the improvements were small, but still statistically significant. One cannot infer, however, that a causal relationship necessarily exists between food instrument redemption rates and positive health outcomes. Even if adequate baseline information on the participant's health status in November 2000 were available, the analysis could not control for many intervening variables, such as actual consumption of WIC foods between November 2000 and April 2001 and other intervening variables. Nevertheless, the consistency of the results suggests that further study of this relationship may be warranted.

Main Findings by Cost-Containment Practice

One of the stated goals of the study was to link various cost-containment practices used in the case study States to their outcomes, in order to better understand their consequences for both WIC participants and pro-

[19]Food instrument redemption rates were measured over the 4-month period November 2000 to February 2001.

Table 3—Health outcomes of WIC participants

Outcome measure	Sample
Birth weight of infant	Pregnant women
Growth in stature (measured by change in height-for-age)[1]	All children
Probability of "exiting" anemic status[2]	Anemic children
Probability of "exiting" underweight status[3]	Underweight children

[1]Height-for-age was obtained by comparing height measurements from WIC certification data to age- and gender-specific reference curves developed by the Centers for Disease Control and Prevention (CDC) in 2000.

[2]CDC guidelines identify anemia in children by hemoglobin below 11 grams/deciliter or hematocrit below 33 percent.

[3]Underweight children identified as those with weight-for-age below the 10th percentile, using age- and gender-specific reference curves developed by the CDC.

gram administration. This section presents each major cost-containment practice and its associated outcomes. However, the section also presents the combined impact of multiple restrictions that affect the same food category (for instance, savings arising when a State restricts both allowed types and packaging of juice).

Competitive Pricing at Application

Four of the six States (all but North Carolina and Ohio) used competitive price criteria when selecting stores to authorize as WIC vendors. The study found no evidence that use of price criteria at application had an adverse effect on participants' access to vendor locations, availability of food items, or continuing participation. This was not surprising because State officials said they rarely denied vendor authorization based on prices. Instead, in order to receive authorization, stores with high prices often agreed to reduce their pricing for WIC purchases.

The study did not examine whether this vendor restriction had an impact on average food package costs. An effect, if one existed, could have gone either way. By keeping out high-price stores, average food package costs could have been reduced. By allowing high-price stores to reduce prices to meet price criteria, however, such policies could have raised average costs by authorizing more stores at the high end of the price distribution. If so, this is a tradeoff that State officials seemed willing to make in order to improve participant access to WIC vendors.

The use of competitive pricing at application was not expected to have an impact on the other outcome measures under investigation—satisfaction with and use of prescribed foods, disproportionate effects on participants on special diets or with food allergies, redemption of food instruments, or achievement of positive health outcomes.

Requiring Purchase of Least Expensive Brands

The most common food-item restriction in the six States was the requirement that participants purchase the least expensive brand of a food category available in the store. Connecticut had this policy for milk, eggs, cheese, citrus juice, and peanut butter. North Carolina, which was selected for this study because it used very few cost-containment practices, required purchase of the least expensive brand of milk. Oklahoma had a least expensive brand policy for milk, eggs, cheese, and dried beans/peas, and Texas required purchase of the least expensive brand of milk and juice.

Table 4 shows that requiring purchase of the least expensive brand of cheese saved Connecticut an estimated $1.04 PPM, and it contributed to savings of $1.14 PPM in Oklahoma (which also limited the number of approved types of cheese). Least expensive brand policies saved $0.10 PPM on peanut butter in Connecticut and $0.03 PPM on dried beans or peas in Oklahoma. Texas' least expensive brand policy for juice, one of several restrictions in effect for juice in that State, contributed to the very large estimated savings of $4.16 PPM. This study did not estimate savings arising from least expensive brand policies on eggs and milk, but program officials in Oklahoma estimated egg savings equal to $0.19 PPM and milk savings equal to $0.57 PPM. These estimates are applied to the other States that used the same policies.

Where States imposed multiple restrictions on individual food categories, it was not possible to estimate the individual effects of each restriction, so the table indicates that savings were "part of" the total estimated savings for that food category.

A comparison of the responses of sampled participants in the case study States with and without least expensive brand policies revealed that the practice was not associated with reduced purchase of foods subject to

Table 4—Estimated savings per WIC participant per month from requiring purchase of least expensive brands

Food category	CA	CT	NC	OH	OK	TX
			Dollars			
Milk		0.57[1]	0.57[1]		0.57[1]	0.57[1]
Eggs		.19[1]			.19[1]	
Cheese		1.04			Part of 1.14[2]	
Juice		Part of 1.69[2]				Part of 4.16[2]
Peanut butter		.10			.03	

Blank cells indicate that State did not impose a least expensive brand policy for that food category.

[1]Savings estimate based on information provided by State WIC officials in Oklahoma; this information is the only available evidence on savings due to least expensive policies for milk and eggs.

[2]State applied multiple restrictions to this food category.

Sources: Survey of Food Prices and Item Availability, State administrative data on food packages, and interviews with State officials.

the restrictions. The policies were correlated with reduced levels of consumption of milk, cheese, eggs, and dried beans/peas, but not peanut butter or juice. In all cases except dried beans/peas, however, respondents who did not eat all the purchased food cited factors unrelated to food-item restrictions as the main reason (for instance, that too much food had been prescribed). Thus, whether least expensive brand policies reduced consumption is unclear. If so, the magnitude of the effect was too small to detect.

There is no evidence that the use of least expensive brand policies affected the study's other outcome measures, or that they had disproportionate effects on participants on special diets or with food allergies.

Limiting Approved Brands

Oklahoma was the only State that required purchase of private-label or store-brand items for cereals and juice. Texas also placed limits on brands of juice, allowing selected national brands.

Oklahoma's restrictions against national brands of cereal saved an estimated $2.72 PPM. The restrictions, however, were associated with lower levels of participant satisfaction with allowed brands of cereal, reduced levels of cereal purchase, and reduced levels of consumption. In response to participant preferences, Oklahoma added some national-brand cereals to its list of approved foods after data for this study were collected.

Brand restrictions on juice had no impact on expressed levels of satisfaction with approved brands, and they did not reduce either the amount of juice purchased or consumed.

Finally, there is no evidence that limiting the number of approved juice and cereal brands affected rates of either food instrument pickup (based on focus group respondents' reasons for dropping out of WIC), instrument redemption, achievement of positive health outcomes, or the availability of allowed juice or cereal in these States.

Limiting Approved Types of Foods

As shown in table 5, all States except Ohio limited the types of certain foods on their approved lists. California approved a relatively small number of cheeses, juices, and cereals, and it prohibited purchase of extra-large or jumbo eggs and infant juice (substituting single-strength juice instead). Connecticut limited egg selection to large white eggs only, and it prohibited purchase of infant juice. North Carolina also prescribed single-strength juice instead of infant juice. Oklahoma prohibited purchase of extra-large or jumbo eggs, and its list of approved foods included relatively few types of cheese and cereal. Texas also prohibited purchase of extra-large or jumbo eggs and infant juice, and it approved a limited number of different types of single-strength juice. The table shows estimated savings from these restrictions.

The largest savings from restrictions on food type were for cereal and juice. The small savings for infant juice in California and Texas, and the negative "savings" in Connecticut and North Carolina, appear because these States, by prescribing single-strength juice instead of infant juice, prescribed extra amounts of juice.

One concern with limiting food types is that participants may have difficulty finding the approved foods at WIC-authorized stores. The study's survey of WIC-authorized stores in each State found no relationship between these restrictions and the availability of approved foods within the stores.

There was no significant difference in the amount of cereal purchased or consumed between States with and without restrictions on cereal type.

There was also no evidence that limiting the number of approved types of food negatively affected rates of either food instrument pickup (based on focus group respondents' reasons for dropping out of WIC), instrument redemption, or achievement of positive health outcomes.

Table 5—Estimated savings per WIC participant per month from restrictions on allowed types of food

Food category	CA	CT	NC	OH	OK	TX
			Dollars PPM			
Eggs	0.16	0.07			0.12	0.10
Cheese	.12				Part of 1.14[1]	
Cereal	.95				Part of 1.72[1]	
Juice	Part of .63[1]					Part of 4.16[1]
Infant juice	.10	-.39	-.06			.22

Blank cells indicate that State did not restrict allowed types of food for that category.

[1]State applied multiple restrictions to this food category.

Sources: Survey of Food Prices and Item Availability, State administrative data on food packages, and interviews with State officials.

Limiting the Allowed Packaging of Foods

All six States set minimum package sizes for at least one WIC food group. California, Oklahoma, and Texas had the most package-size restrictions.

Ohio and Oklahoma generally prohibited purchase of milk in half-gallon or quart containers. These restrictions saved the States an estimated $0.05 PPM in both Ohio and Oklahoma. State officials in California estimated that their efforts to have participants buy milk in 2-gallon "value packs" saved an amount equal to $0.38 PPM.

Restrictions on egg sizes saved an estimated $0.16 PPM in California, $0.07 PPM in Connecticut, $0.12 PPM in Oklahoma, and $0.10 PPM in Texas.

Texas imposed larger package size requirements on cereal purchases to take advantage of their lower per ounce costs. The estimated savings from this policy were $2.00 PPM. The State's restrictions on shelf-stable juice containers (46-ounce cans only) contributed to juice savings of $4.16 PPM.

There is no evidence that limiting the package forms of food negatively affected either rates of food instrument pickup (based on focus group respondents' reasons for dropping out of WIC), instrument redemption, consumption of prescribed foods, the achievement of positive health outcomes, or program participation.

Manufacturer Rebates

California, Connecticut, and Texas received rebates on sales of infant cereal through contracts that specified a single allowed brand. These rebates saved an estimated $0.32 PPM in California, $0.37 PPM in Connecticut, and $0.27 PPM in Texas.

The infant cereal rebates did not affect the availability of allowed brands in the three States. They were binding on almost no WIC participants, and the brand restrictions were not related to levels of brand satisfaction, amount purchased, or amount consumed. There is also no evidence that the infant cereal rebates affected rates of food instrument redemption, program participation, or the achievement of positive health outcomes.

Multiple Food-Item Restrictions

The States in the study imposed multiple food-item restrictions for some foods, and it was not possible for the study to estimate the singular effect of the individual restrictions. This section summarizes the total effects of these multiple restrictions.

For cheese, least expensive brand policies and restrictions on type and packaging created binding constraints on a cross-State average of 8.8 percent of survey respondents, with the lowest rate in North Carolina (1.1 percent) and the highest rates in Oklahoma (15.7 percent) and Ohio (12.6 percent).

Restrictions on brand, type, and packaging of breakfast cereal were binding on a cross-State average of 10.0 percent of survey respondents, with the highest rates in Oklahoma (19.4 percent), Connecticut (15.1 percent), and North Carolina (12.7 percent). Texas had the lowest rate (1.7 percent).

Least expensive brand policies and restrictions on brand, type, and packaging of juice were binding on a cross-State average of 6.9 percent of survey respondents, with the highest rates in California (13.3 percent) and Texas (12.1 percent). The lowest rate was in North Carolina (1.0 percent).

Finally, there is no evidence that any food-item restrictions had a differential impact on WIC participants with food allergies or those on special diets.

Implications of the Findings for Other States

The cost-containment practices implemented by the six case study States were relatively inexpensive to manage and operate, reduced food package costs, and had few adverse impacts on WIC participants. It is therefore tempting to conclude that all States should implement similar practices.[20]

For cost-containment practices to work, they need to be well managed by State officials. The success of cost containment in the case study States was the result of ongoing efforts by these States to find those restrictions that both reduced food package costs and were acceptable to participants. (For instance, all six States collected price information on a regular basis and obtained feedback from local offices on participant comments on allowed foods.) What works well in one State might not work at all in another. Similarly, an effective practice today may not work tomorrow. Selecting and managing appropriate cost-containment practices is therefore a dynamic process, requiring ongoing attention to local food markets (especially

[20]Many other States, of course, already use cost-containment practices (see appendix A for practices adopted by States). The six States in this study were selected to allow analysis of different combinations of these practices.

price and availability of federally approved food items) and participant preferences.

A critical factor in this process lies in the ongoing evaluation of program effectiveness. To facilitate this activity, States should not overlook the ability to systematically collect and analyze relevant data. In the process of assessing cost-containment practices for this study, considerable limitations and difficulties were encountered due to a lack of program information in readily usable form. In most States, for example, the effects of cost-containment practices on food redemptions could not be completely analyzed due to different foods being combined on individual food instruments.

This study provides evidence that cost-containment practices can reduce WIC food package costs. Estimates of cost savings in other States are beyond the scope of this study, as are estimates of the potential for additional savings if further restrictions were adopted. The potential for further cost savings would depend on States' current use of vendor and item restrictions and Federal incentives for States to adopt additional restrictions. Furthermore, not all cost-containment practices may be appropriate for all States because of differences in item prices, availability, and participant preferences. States therefore need the flexibility to find the right balance between food cost reductions and limits on participant choice and use.

Appendix A: Cost-Containment Practices, 1999

Appendix table 1—Use of competitive pricing for WIC vendor selection, 1999

State (alphabetical by region)	State used competitive pricing	Competitive pricing criterion[1]	Stringency of criterion[2]
Northeast			
Connecticut	✓	Prices < avg + NS%	L
Maine	✓	Prices < avg + 10%	H
Massachusetts	✓	No[3]	H
New Hampshire	✓	Prices < avg + NS%	L
New York	✓	Prices < avg + 10%	H
Rhode Island	✓	Prices < avg + NS%	L
Vermont (home delivery)			
Mid-Atlantic			
Delaware (price-bid contracts)			
District of Columbia	✓	Prices < avg + NS%	L
Maryland	✓	Prices < avg + 25%	L
New Jersey	✓	Prices < avg + NS%	L
Pennsylvania	✓	Prices < max allowed	L
Virginia	✓	If vendor limit reached	L
West Virginia	✓	Prices < avg + 10%	H
Southeast			
Alabama	✓	Prices < avg + NS%	L
Florida	✓	Prices < avg + NS%	L
Georgia	✓	Prices < avg + 10%	H
Kentucky	✓	Prices < avg + 10%	H
Mississippi (home delivery)			
North Carolina			
South Carolina	✓	Prices < avg + NS%	L
Tennessee	✓	Prices < avg + 10%	H
Midwest			
Illinois	✓	Prices < avg + 5%	H
Indiana	✓	Prices < avg + 10%	H
Michigan	✓	Prices < avg + NS%	L
Minnesota	✓	Prices < avg + 20%	L
Ohio	✓	If vendor limit reached[4]	L
Wisconsin	✓	Prices < avg + 15%	L
Mountain Plains			
Colorado	✓	Prices < avg + 10%	H
Iowa	✓	Prices < avg + 5%	H
Kansas	✓	Prices < avg + NS%	L
Missouri	✓	Prices < avg + 10%	H
Montana	✓	Prices < avg + NS%[5]	L
Nebraska	✓	Prices < avg + 10%	H
North Dakota			
South Dakota	✓	Prices < avg + 15%	L
Utah	✓	Prices < avg + 5%	H
Wyoming	✓	Prices < avg + 15%	L

See footnotes at end of table.

Continued—

Appendix table 1—Use of competitive pricing for WIC vendor selection, 1999—Continued

State (alphabetical by region)	State used competitive pricing	Competitive pricing criterion[1]	Stringency of criterion[2]
Southwest			
Arkansas	✓	Prices < avg + 10%	H
Louisiana	✓	Prices < avg + 10%	H
New Mexico	✓	Prices < avg + 10%	H
Oklahoma	✓	Prices < avg + 5%[6]	H
Texas	✓	Prices < avg + 8%	H
Western			
Alaska	✓	Prices < avg + NS %	L
Arizona	✓	Prices < avg + 30%	L
California	✓	Prices < avg + NS %	L
Hawaii	✓	Prices < avg + 30%	L
Idaho	✓	Prices < avg + 25%	L
Nevada	✓	Prices < avg + 5%	H
Oregon			
Washington	✓	Prices < avg + 20%	L
Total	45		

[1]"Price < avg + NS %" denotes that State used competitive pricing at application, but vendor materials did not specify the terms of the competitive pricing scheme.

[2]Twenty States with limits of 10 percent or less above average prices are rated as "H-highly restrictive"; 25 States using prices for selection are rated as "L-less restrictive."

[3]Massachusetts did not reject applicants based on prices, but the State informed applicants if prices were above average and likely to incur penalties. The effect of this process was considered highly selective.

[4]Ohio required new vendors to accept payment at no more than 90 percent of the maximum value of food instruments unless they applied during the regular authorization period, which occurred once every 3 years in each county.

[5]Montana vendor selection information is from FNS profile; no materials received from State.

[6]Oklahoma used competitive pricing criteria only at reauthorization.

Appendix table 2—WIC item cost-containment practices, 1999

State	Least expensive brand	Require store brands	Restrict product size[1]	Range of choice: Cold cereals	Range of choice: Adult juice[2]	Rebates on food
Northeast						
Connecticut	m,c,e,j,pb		cer,fj			Gerber (cereal)
Maine	j		cer,fj	Narrow		
Massachusetts	m		cer,fj	Broad		
New Hampshire	m,e,pb		m,fj			
New York			m,cer,fj	Narrow		Gerber (cereal)
Rhode Island (missing food list)						
Vermont (home delivery)						
Mid-Atlantic						
Delaware			c	Narrow	Narrow	Gerber (cereal/juice)
District of Columbia					Narrow	Gerber (cereal/juice)
Maryland			m,fj		Broad	Gerber (cereal/juice)
New Jersey			m,cer,fj			
Pennsylvania			cer,fj			
Virginia	m		m,fj			
West Virginia			fj			Gerber (cereal/juice)
Southeast						
Alabama			m,fj			
Florida	m,e,j		m,cer		Narrow[2]	
Georgia	e,j		m,c,cer			
Kentucky			fj			
Mississippi (home delivery)						
North Carolina	m		cer,fj		Broad	
South Carolina			fj		Broad	
Tennessee			m,cer,fj	Broad	Broad	
Midwest						
Illinois	m,c		m,fj	Broad	Broad	
Indiana			m,cer,fj			Beechnut (cereal)
Michigan			cer,fj		Broad	
Minnesota			m,cer,fj	Broad	Broad	
Ohio			m	Broad	Broad	
Wisconsin			m,fj	Broad	Broad	
Mountain Plains						
Colorado		m,c,e	c,fj	Broad		
Iowa			fj	Broad		
Kansas	m,c,e,j,pb,ic		c,cer,fj	Narrow		
Missouri (missing food list)						
Montana				Broad		
Nebraska		m	fj		Narrow	
North Dakota			m	Broad		
South Dakota			cer			
Utah	m,c,e,j,pb		fj		Narrow[3]	
Wyoming			fj		Narrow[3]	

See footnotes at end of table.

Continued—

Appendix table 2—WIC item cost-containment practices, 1999—Continued

State	Least expensive brand	Require store brands	Restrict product size[1]	Range of choice: Cold cereals	Range of choice: Adult juice[2]	Rebates on food
Southwest						
Arkansas	m,c,e,j		c	Broad		
Louisiana	m		m,c,fj	Narrow		
New Mexico	m,c,e,j,pb		cer,fj	Narrow	Narrow[3]	
Oklahoma	m,c,e	cer	m,cer,fj	Narrow	Narrow	
Texas	m,j		m,cer,fj	Narrow	Narrow[2]	Gerber (cereal)
Western						
Alaska			fj		Broad	
Arizona			fj	Narrow		
California	m		m,c,cer,fj	Narrow	Narrow	Gerber (cereal); adult juice
Hawaii			m,cer,fj	Narrow	Narrow	
Idaho			fj	Narrow		
Nevada	m,e,pb		cer		Narrow[2]	Gerber (cereal)
Oregon			fj		Narrow	
Washington			fj		Broad	

[1]Restricted product size is indicated if minimum size was: 1/2 gallon or 1 gallon for milk; 9 oz. or larger for cheese; larger than 6 oz. of frozen juice; any specified size for cereal. If food list required "least expensive or store brand," then only "least expensive" column is checked.

[2]Least expensive brand policy reduced number of allowed national brands.

[3]Only frozen juice allowed.

Definitions:

c = Cheese
cer = Cereal
e = Eggs
fj = Frozen juice
ic = Infant cereal
j = Juice
m = Milk
pb = Peanut butter

Appendix B: Data Sources

The analysis of the impacts of WIC cost-containment practices relies on a variety of data sources, including both extant data and data collected from the case study States specifically for this study. These include:

- State WIC administrative data
- Interviews with State and local WIC officials
- A survey of WIC participants
- A store survey of the price and availability of WIC food items
- WIC transaction data collected from supermarkets
- Focus groups with participants who dropped out of the WIC program
- Interviews with other concerned stakeholders

Each data source is summarized below.

State WIC Administrative Data

Two types of State administrative data were collected: participant certification records and food instrument data.

Statewide administrative records for WIC participants were obtained from the six case study States at two points in time: November 2000 and April 2001. These files contain demographic characteristics of WIC participants and certification information such as nutritional risks, health status, food package prescription, and income level.

Statewide food instrument data were collected from each State for a 4-month period, from November 2000 through February 2001. The data typically include one record for each WIC food instrument issued, with data elements indicating its status (issued, paid, rejected, or void), date paid, and payment amount.

Administrative data on participants from November 2000 provided the sampling frame for the study. Three geographic areas were selected for primary data collection within each State, representing urban, suburban, and rural areas. Selection of geographic areas was based on caseload counts, with selection proportionate to caseload size. Primary data collections in the three geographic areas were the Survey of WIC Participants, the store survey, and the interviews with State and local WIC agencies.

Administrative data were also used for several lines of analyses. Statewide participant records were used to characterize participants for the analyses of food instrument redemption and to explore the association between redemption and change in health status (as measured from the November and April certification files). Food instrument data were used to measure food instrument redemption rates for each State and to examine the relationship between food instrument redemption and health outcomes.

Interviews with State and Local WIC Officials

Interviews were conducted with representatives of all six State WIC agencies selected for the study. These interviews, held between May and August 2001, provided information on the procedures for applying cost-containment measures, the results of the measures, staff time and other costs devoted to maintenance of the measures, and views of State staff on the impacts of cost-containment measures on program costs and participant outcomes.

In addition, three local agencies representing urban, suburban, and rural areas were selected in each State for telephone interviews. These agencies provided information on local agency involvement in, and experience with, cost-containment measures—principally the provision of training and assistance to participants about food-item restrictions. The local agency interviews were conducted between July and September 2001.

Survey of WIC Participants

The Survey of WIC Participants interviewed a total of 1,285 WIC families in the six States, between February and June 2001. Most interviews were conducted by telephone; for the 12.3 percent of sampled participants who could not be reached by telephone, interviews were conducted by field staff at participants' homes. The overall survey response rate was 77 percent.

The survey collected information about satisfaction with WIC food items; food instrument pickup; food-item purchase, consumption, and preferences; participant access to WIC vendors; program participation; presence of special diets or food allergies; and health referrals.

Survey of Price and Availability of WIC Food Items

The Survey of Food Prices and Item Availability collected price information and data on food-item availability from a sample of 106 WIC food stores in the six case study States (17 to 18 WIC-authorized vendors in each State).

Data collectors visited each sampled store and checked on the price and availability of over 400 food items approved for WIC under Federal guidelines. These data were used to estimate cost savings from food-item restrictions.

WIC Transaction Data from Supermarkets

In retail food stores that scan food-item bar codes at checkout, the store's point-of-sale (POS) system automatically creates a record of each scanned item. These records can be used to identify food items purchased in WIC transactions if the POS system saves detailed information about the type of tender used in the transaction. The study contacted all the large supermarket chains in the six case study States to inquire whether their POS systems could identify food items paid for with WIC checks or vouchers. A number of POS systems could not. Supermarket chains whose POS systems could identify WIC transactions were invited to participate in the study by providing copies of their WIC transaction data for a 5- to 6-week period in early 2001. Six supermarket chains agreed to provide data from nearly 600 stores. Together, these scanner data provide information for over one-half million WIC transactions in five of the six States; no supermarkets in Oklahoma were able to participate in the study.

Focus Group Discussions with WIC Program Dropouts

Focus groups were conducted with WIC participants who did not pick up their WIC food instruments and who indicated, during a screener survey, that this was related to dissatisfaction with either WIC food items or access to WIC vendors. Six focus groups were conducted in five States, collecting indepth, qualitative information on the reasons WIC participants fail to make full use of their WIC food benefits.[21]

A focus group moderator used the same topic guide in all States. Topics were broadly focused on WIC participants' satisfaction with the selection of WIC-approved foods, access to WIC vendors, and ease of using WIC food instruments. The goal of the focus groups was to determine the extent to which cost-containment practices affected these participants' decisions to stop picking up their WIC checks and vouchers.

Although focus groups do not provide data that can be compared across States in a quantitative way, they provide indepth qualitative insights about WIC participants' satisfaction. The stories told by the focus group members allowed the study to determine whether particular aspects of cost-containment practices are singled out by WIC participants when they describe their experiences with the program.

Interviews with Concerned Stakeholders

In addition to collecting information from WIC agencies, the study contacted representatives from food industry associations and from the National WIC Association (NWA), formerly the National Association of WIC Directors (NAWD). These organizations have expressed concerns in the past about WIC cost-containment practices. Many of these concerns were investigated as part of the study. In summary:

- The NWA is a voluntary membership organization representing State and local WIC agencies nationwide. NWA members expressed two main concerns about cost-containment practices: (1) the negative impact of food-item restrictions on program participation; and (2) obstacles to States' utilization of food cost savings to increase Federal NSA funds in support of higher WIC participation levels.[22] They stressed that States needed flexibility in designing food packages to attract and retain program participants.

- The Grocery Manufacturers of America (GMA) is a trade organization representing companies that manufacture and market most of the best known national brand products. Their biggest concern with cost-containment efforts is those practices that reduce WIC participants' choices among brands of WIC-approved products, especially breakfast cereals. They believe that such restrictions reduce participant satisfaction and can lead to decreased participation in WIC.

- Members of the Private Label Manufacturers Association (PLMA) are pleased that private-label, or store-brand, items are being added to WIC-approved food lists in many States. They perceive,

[21] A planned focus group in Hartford, Connecticut was cancelled because not enough participants who met the screening criteria could be recruited.

[22] NWA's concern with States' use of food cost savings has been addressed by FNS since the interview was conducted. In December 1999, FNS published a rule expanding conversion authority for cost-containment savings to NSA funds. According to the rule, a State WIC agency "may now convert food funds to NSA funds based on projected increases in participation instead of just actual participation increases." The NSA expenditure standard was reduced to 10 percent to improve accountability for the new conversion authority and to prevent this expanded conversion authority from being used to substantially shift food money to NSA spending without increased cost-containment savings and participation.

however, that some State WIC agencies are biased against private-label foods. Members also are concerned with policies that require WIC-approved food items to be available statewide, because not all food chains operate throughout a State. Finally, PLMA members believe that limiting vendors may (unintentionally) eliminate many private-label products from the WIC program and lead to increased costs and reduced product availability for WIC participants.

- The Food Marketing Institute (FMI) and the National Grocers Association (NGA) are trade associations representing food retailers and wholesalers. These groups do not like cost-containment practices designed to limit the number of WIC-authorized vendors, arguing that such practices are inefficient and expensive to implement. The groups believe that the practices tend to reduce participation of smaller neighborhood stores, which in turn affects WIC participants' accessibility to WIC-authorized stores. They also do not like price ceilings, which they claim are unfair to small retailers whose cost structures are higher, or least expensive brand policies, which they believe confuse store clerks and WIC customers.